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PSYCHOLOGICAL REVIEW PUBLICATIONS

February, 1924

# Psychological Bulletin

EDITED BY

SAMUEL W. FERNBERGER, UNIV. OF PENNSYLVANIA

HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)JOHN B. WATSON, NEW YORK (*J. of Exp. Psych.*)SHEPHERD I. FRANZ, GOVT. HOSP. FOR INSANE (*Monographs*)MADISON BENTLEY, UNIVERSITY OF ILLINOIS (*Index*)

## WITH THE CO-OPERATION OF

R. T. BALDWIN, UNIVERSITY OF IOWA; W. V. BUGHAM, CARNEGIE INSTITUTE OF TECHNOLOGY; J. E. COOVER, STANFORD UNIVERSITY; W. S. HUNTER, UNIVERSITY OF KANSAS; K. S. LASHLEY, UNIVERSITY OF MINNESOTA; J. H. LEUBA, BRYN MAWR COLLEGE; M. F. MEYER, UNIVERSITY OF MISSOURI; R. M. OGDEN, CORNELL UNIVERSITY; R. S. WOODWORTH, COLUMBIA UNIVERSITY.

## CONTENTS

*Proceedings of the Thirty-Second Annual Meeting of the American Psychological Association, Madison, Wisconsin, December 27-29, 1923:* J. E. ANDERSON, Secretary, 69.

*Abstracts of Papers*, 85.

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# Psychological Review Publications

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HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)  
JOHN B. WATSON, 244 MADISON AVE., NEW YORK (*J. of Exp. Psych.*)  
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MADISON BENTLEY, UNIVERSITY OF ILLINOIS (*Index*)  
SAMUEL W. FERNBERGER, UNIV. OF PENN. (*Bulletin*)

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# THE PSYCHOLOGICAL BULLETIN

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PROCEEDINGS OF THE THIRTY-SECOND ANNUAL  
MEETING OF THE AMERICAN PSYCHOLOGICAL  
ASSOCIATION, MADISON, WISCONSIN, DECEMBER  
27, 28, 29, 1923

REPORT OF THE SECRETARY, JOHN E. ANDERSON, YALE UNIVERSITY

The American Psychological Association held its thirty-second annual meeting at the University of Wisconsin, Madison, on Thursday, Friday and Saturday, December 27, 28, and 29, 1923. The sessions were held in Bascom Hall with the exception of the Business Meeting and the Symposium which were held in the Auditorium of the Biology Building. One hundred and twenty-seven persons registered, but it is probable that some of the members present failed to record their names. There were one hundred and thirty persons present at the annual banquet.

In arranging the program, the Program Committee placed two programs in each of the five half-day sessions, staggering the programs by one paper. The papers in each half of the program varied from four to six. All of the programs were well attended.

A special program for Informal Reports by Graduate Students was arranged by the Program Committee, as an experiment to determine the feasibility of having those who are doing major experimental problems report upon their work. Thirteen papers were recommended for this session, of which number eleven were actually presented. On the whole the program seemed to be successful and to warrant its continuance in future years.

A Symposium on the "Contributions of Freudianism to Psychology" was held in the Auditorium of the Biology Building on the second day of the meetings. It was unusually well attended, both by members of the Association and by others.

At a conference of Experimentalists held on the morning of the last day of the meetings, forty-five persons were present. An informal discussion centering around the topic of perception was held, in which those present participated freely. Conferences of this type, judging by the success of this, would be worth while additions to future meetings.

Exclusive of the Session for Informal Reports by Graduate Students and the Symposium, thirty-nine papers were presented. Of these eight dealt with general psychology, eleven with experimental psychology, six with industrial psychology, four with mental measurement, and five with clinical and educational psychology, the last two classifications overlapping so as to be indistinguishable. Half the papers read dealt with topics related to General and Experimental Psychology, indicative of a return of interest in the more fundamental aspects of the science, as contrasted with the decided shift noted in recent programs in the direction of applied and clinical psychology.

An apparatus exhibit was held in the Psychological Laboratory in Bascom Hall. Exhibits were made by the C. H. Stoelting Company and by several members.

#### TRANSACTIONS OF THE ANNUAL BUSINESS MEETING

The annual business meeting was held on December 27, 1923, at eight o'clock, with Mr. G. F. Arps, senior member of the Council, in the chair, the President being unable to be present because of illness.

It was voted that the minutes of the thirty-first annual meeting at Cambridge be approved as printed.

The Secretary made the following announcements:

That Professor H. A. Ruger of Columbia University acted as representative of the Association at a "Conference on Abbreviations and Symbols" held under the auspices of the American Engineering Standards Committee in New York City on Tuesday, February 13, 1923.

That the Association was represented at the Inauguration of President Lewis of George Washington University on November 7, 1923, by Shepherd Ivory Franz.

The Secretary announced the deaths of

C. O. Taylor, April, 1922.

Archie Lewis Ide, February 28, 1923.

Harry Haynes Wylie, June 10, 1923, aged forty-three.



Stephen S. Colvin, July 15, 1923, aged fifty-four.  
Boris Sidis, October 25, 1923, aged fifty-five.

The Secretary announced the resignations during the year 1923 of Messrs. Addison C. Moore, F. C. French, H. W. Chase, J. W. Hayes, E. E. Jones, and L. C. Stewardson.

It was voted to adopt the amendment to the Constitution increasing the dues from two dollars to five dollars. The amended first sentence of Article IV of the Constitution reads, "The annual subscription price shall be five dollars in advance." Since this amendment had been voted for the first time at the thirty-first annual meeting, it became effective immediately upon this vote.

The Treasurer's report as printed on page 77 was read and approved.

The Treasurer presented the following estimate of resources for the year 1924:

*Estimate of Resources*

Dues from members.....	\$2,250.00
Interest (approximate) .....	30.00
Sale of monographs (approximate).....	5.00
Cash on deposit .....	257.86
	<hr/>
	\$2,542.86

On recommendation of the Council, it was voted that for the words in By-Law 3, first sentence "at least one month in advance of the annual meeting," the words "not later than March 15th of the year in which the nomination is to be first acted upon" be substituted, making this sentence of the By-Law read—

A nomination for membership must be signed by at least two members of the Association, and must be submitted to the Secretary for the Council, not later than March 15th of the year in which the nomination is to be first acted upon.

On recommendation of the Council it was voted that for By-Law 4, the following be substituted:

The Council shall have the power to defer action upon such proposals for membership as it deems necessary, providing, however, that by the third annual meeting after the original receipt of the nomination papers, it must decide either to present or not to present the candidate's name to the Association. A proposal for membership cannot be renewed until two years have elapsed after the Council's action upon it.

On recommendation of the Council it was voted that a committee of three be appointed by the retiring president to consider the advisability of the establishment of an "associate" grade of membership and to report at the 1924 meeting with recommendations.

On recommendation of the Council it was voted that the Secretary be empowered to print a list of members arranged by states and institutions in the Year Book in addition to the present alphabetical list of members.

On recommendation of the Council it was voted that the Secretary be instructed to codify the regulations of the Association concerning committees and print them tentatively in the Year Book for consideration as By-Laws by the next annual business meeting.

The Treasurer presented a budget for the year 1924, as printed on page 78, which was approved by vote of the Association.

On recommendation of the Council, Mr. R. M. Yerkes and Mr. W. V. Bingham were elected to represent the Association on the Council of the American Association for the Advancement of Science in 1924.

The Secretary announced for the Council the appointment of the following Program Committee for 1924: Mr. John E. Anderson, Chairman, Mr. H. L. Hollingworth, and Mr. S. W. Fernberger.

On recommendation of the Council it was voted that the 1924 meeting of the Association be held in Washington, D. C., in affiliation with the Quadrennial Convocation Meeting of the American Association for the Advancement of Science on Monday, Tuesday and Wednesday, December 29 to 31 inclusive, and that Mr. L. L. Thurstone be local representative and member of the Executive Committee.

On recommendation of the Council the twenty-two persons named below, were elected to membership in the Association.

1. Anderson, Lewis O., Ph.D. University of Wisconsin 1922  
Instructor in Psychology, Hibbing Junior College
2. Franzen, Raymond H., Ph.D. Columbia 1920  
Assistant Professor of Psychology and Education, University of California
3. Garrett, Henry E., Ph.D. Columbia 1922  
Instructor in Psychology, Columbia
4. Garrison, Sidney C., Ph.D. George Peabody College 1919  
Professor of Educational Psychology, George Peabody College

5. Gilliland, A. R., Ph.D. Chicago 1922  
Associate Professor of Psychology, Lafayette College
6. Guernsey, Martha, Ph.D. Michigan 1921  
Instructor in Psychology, University of Michigan
7. Haught, Benjamin F., Ph.D. George Peabody 1921  
Associate Professor of Psychology and Education, University of New Mexico.
8. Holmes, Joseph L., Ph.D. Columbia 1923  
Instructor in Psychology, Columbia
9. Leaming, Rebecca E., Ph.D. Pennsylvania 1922  
Director, Beaver County Child Study Bureau
10. Murphy, Gardner, Ph.D. Columbia 1922  
Lecturer in Psychology, Columbia
11. Newhall, Sidney M., Ph.D. Columbia 1923  
Instructor in Psychology, Yale University
12. O'Rourke, L. J., Ph.D. George Washington 1921  
Director of Research, U. S. Civil Service Commission
13. Pratt, Marjory Bates, Ph.D. Clark 1922  
Instructor in Psychology, Wellesley
14. Richter, Curt P., Ph.D. Johns Hopkins 1921  
Instructor in Psychobiology, Johns Hopkins
15. Spencer, L. T., Ph.D. Yale 1923  
Instructor in Psychology, Yale University
16. Stanton, Hazel M., Ph.D. Iowa 1922  
Psychologist, Eastman School of Music, Rochester, N. Y.
17. Stenquist, John L., Ph.D. Columbia 1921  
Director, Bureau of Educational Research, Public Schools, Baltimore
18. Stockton, James L., Ph.D. Stanford 1920  
Vice-President, State Teachers College, Santa Barbara, California
19. Sullivan, Alice H., Ph.D. Cornell 1920  
Instructor in Psychology, University of Illinois
20. Symonds, Percival M., Ph.D. Columbia 1923  
Professor of Education and Psychology, University of Hawaii
21. Warden, Carl J., Ph.D. Chicago 1922  
Instructor in Psychology, University of Wisconsin
22. Wood, Ben D., Ph.D. Columbia 1923  
Assistant Professor of Collegiate Educ. Research, Columbia

On request of the Council it was voted that in view of the unusual circumstances in the case of Hazel M. Stanton that the provisions of By-Law 3 relating to the submission of nomination proposals one month in advance of the annual meeting be waived.

On recommendation of the Council, it was voted that an invitation to become a constituent Society in the Social Science Research Council be declined.

The Report of the Committee on the Election of Officers was then presented as follows:

President: G. Stanley Hall, Clark University.

Members of the Council, 1924-1926: R. Pintner, Columbia University; A. T. Poffenberger, Columbia University.

Nominees for appointment to the Division of Anthropology and Psychology of the National Research Council: E. L. Thorndike, Columbia University; Knight Dunlap, Johns Hopkins University.

The Report of the Standing Committee on the Certification of Consulting Psychologists, as printed on page 78, was then presented. On recommendation of the Council, the report of the Committee was accepted and its provisions adopted.

A letter from the Chairman of the Committee on the Relation of Psychology to Public Welfare was read, in which it was stated that the Committee had taken no action during the year. The resignation of Mr. E. G. Boring from the Committee was presented.

On recommendation of the Council, Francis N. Maxfield was elected Chairman of this Committee for the term 1924 to 1928; Mr. Boring's resignation was accepted, and David Mitchell elected for the unexpired portion of Mr. Boring's term, 1924.

The Report of the Committee on Terminology as printed on page 80 was next presented. On recommendation of the Council it was voted that this Committee be discharged with the thanks of the Association for its careful work.

The Report of the Committee on the Relation of the Association to Publication, followed by a supplementary report, both of which are printed on page 81, was then presented. On recommendation of the Council it was voted that the reports be accepted, that the Committee on the Relation of the Association to Publication be continued, that it be instructed to consider ways and means by which the Association might take up Mr. Warren's option and administrate the journals, and further that it be instructed to obtain the sentiment of the Association with respect to the various possibilities by a mail vote and that it make specific recommendations to the Association at the 1924 meeting.

The Secretary read the following resolution of the Council:

"The Council is unanimously of the opinion that, in view of the services of Mr. Warren and his associate editors to psychology in the past, in the event of the taking up of the option, it would be desirable to continue the present administration of the journals."

The Report of the Committee on Check Lists of Psychological Books as printed on page 82 was presented. It was voted that the Committee report be received, the Committee be continued and that a one hundred dollar appropriation be given the Committee for the year 1924.

The report of the Committee on the Incorporation of the Association was presented in the form of an excerpt from a letter by Mr. J. McKeen Cattell, Chairman, transmitting some correspondence with Senator Lodge and others regarding the matter which in substance stated that as it was almost impossible to secure national incorporation it would be advisable to proceed with the incorporation in the District of Columbia, a practice followed by similar organizations. On the recommendation of the Council it was voted that the Committee be instructed to proceed with the incorporation in the District of Columbia, reporting for the Council's approval the proposed draft of the charter.

The report of the Committee on a Section of Industrial Psychology, under date of February 1, 1923, was submitted in the form of a proposed by-law as follows:

There shall be within the Association a Section of Industrial Psychology (or applied psychology or psychological engineering) which shall determine its own organization and membership, subject only to the approval of the Association as a whole; provided, however, that no person may be a member of this Section who is not also a member of the American Psychological Association.

In addition an excerpt from Dr. Cattell's letter of December 8, 1923, was presented, which stated that it was the sense of the Committee at an informal meeting that a Section of this character was desirable but that it would be best not to decide definitely on its establishment until the success of the Madison program was observed and the general sense of the members interested in industrial psychology determined.

It was voted that this report be referred back to the Council of the Association for consideration and report at the next annual meeting.



It was voted that at the Washington meeting there be a separate program for Industrial Psychology and that the Committee be continued to coöperate in arranging such a program.

A report from the Committee on the Organization of a Section of Educational Psychology was presented. The following quotation is made from the report:

The Committee authorized by the Council to make recommendations as to the advisability of forming a Section of Educational Psychology reports as follows: A Questionnaire was sent to each member of the Association. Replies were received from 175 members.

These responses have been evaluated with reference to the opinion indicated concerning the desirability of establishing a Section in Educational Psychology. In view of the conflict of opinion represented by the replies the Committee does not recommend the formation of a Section of Educational Psychology and would leave to the Council decision as to whether the proposition should be presented to the Association.

On the recommendation of the Council it was voted that the report of the Committee be accepted. An amendment to the original motion that the Committee be continued was lost.

The report of a Committee on an International Congress consisting of J. McK. Cattell, Chairman, J. R. Angell, E. G. Boring, Raymond Dodge, W. B. Pillsbury, E. L. Thorndike, E. B. Titchener, R. S. Woodworth, R. M. Yerkes, selected by the Council in May, 1923, was presented in the form of the following proposed resolutions:

*Resolved*, that the American Psychological Association extends a cordial invitation to the VIII International Congress of Psychology to meet in America during the summer of 1926.

*Resolved*, that the Secretary of the American Psychological Association be instructed to inform the International Committee on the Place of Meeting of the Congress that adequate provision can be made for the meetings, and that it is hoped that university lectureships can be arranged through which the traveling expenses of a number of European psychologists will be defrayed.

The Secretary read several documents bearing on the question of the International Congress and presented a unanimous vote of the Council recommending that the Association should not extend an invitation to the Eighth International Congress to meet in America.

It was voted that the recommendation of the Council be adopted and that the Committee be discharged with the thanks of the Association.

Mr. E. A. Bott of the University of Toronto presented an invitation from the British Association for the Advancement of Science inviting psychologists to attend and contribute to the meetings to be held in Toronto from August 6 to 14, 1924.

It was unanimously voted, to extend to the University of Wisconsin and to the Department of Psychology of the University of Wisconsin the grateful thanks of the American Psychological Association for the entertainment provided and the many courtesies received at the 1923 meeting of the Association in Madison.

The following resolution was voted:

*Whereas*, Professor Joseph Jastrow, the first secretary of the American Psychological Association and its president in 1900, was appointed to a chair of psychology in the University of Wisconsin in 1888, and has occupied this position for an unbroken period of thirty-five years, a record unique in the history of our science, therefore

*Resolved*, that the American Psychological Association, meeting at Madison, presents its sincere congratulations to the University of Wisconsin on the long and distinguished service rendered by Professor Jastrow to it and for the advancement of psychology.

It was moved and seconded that the words \$250 in By-Law 13, referring to the Secretary's stipend be changed to \$750. The Treasurer explained that it was the intent of the Council in setting the Secretary's stipend at \$750 for the year 1924, to make of this a temporary arrangement until information could be obtained as to the financial status of the Association under the increase in dues voted under the amendment to the Constitution at the 1922 and 1923 meetings. The Council, under the authority of the vote of the Association at the 1922 meeting, has the power to raise the Secretary's stipend to \$1,200, but does not feel that such a move is justified at the present time. The motion was lost.

The meeting adjourned at 10:00 P.M.

JOHN E. ANDERSON

*Secretary*

#### REPORT OF THE TREASURER FOR THE YEAR 1923

Dr.

To Balance from the previous year.....	\$1472.05	
Dues received from members.....	900.25	
Sale of Monographs 51 and 53 in 1922.....	5.76	
Interest, October, 1922, to October, 1923.....	41.69	
		<hr/>
		\$2419.75

Cr.	
By Printing and supplies .....	\$205.56
Postage.....	112.18
Reprints.....	112.71
Abstracts.....	62.43
Incidentals of meeting, 1922.....	60.35
Year Book .....	249.55
Incidentals.....	17.25
Election Committee .....	46.00
Secretary's stipend .....	500.00
Treasurer's stipend .....	50.00
Exchange on checks .....	3.80
	<hr/>
	\$1419.83
Balance in Fifth Avenue Bank.....	\$257.86
Balance in Union Dime Savings Institution.....	742.06
	<hr/>
	999.92
PHILADELPHIA, PA.	
December 15, 1923.	<hr/>
	\$2419.75

SAMUEL W. FERNBERGER,  
Treasurer

Audited and found correct:

F. L. WELLS  
EDWIN G. BORING  
December 26, 1923

#### BUDGET FOR 1924

Printing and supplies.....	\$500.00
Postage.....	150.00
Reprints.....	250.00
Abstracts.....	100.00
Incidentals of meeting .....	100.00
Apparatus exhibit .....	50.00
Election Committee .....	100.00
Library Check List Committee.....	100.00
	<hr/>
	\$1350.00
Secretary's stipend .....	\$750.00
Treasurer's stipend .....	50.00
	<hr/>
	800.00
	<hr/>
	\$2150.00

#### REPORT OF THE STANDING COMMITTEE ON THE CERTIFICATION OF CONSULTING PSYCHOLOGISTS

1. Since the last report, certificates as authorized have been issued to nine members of the American Psychological Association. The total number of certificates in force at this date is 24.

2. The receipts for the year are from fees, \$385.00; interest, \$4.33; total, \$389.33. The total expenditures, including bills payable, are \$39.58.

There remains a balance of \$473.89 on deposit with the Brookline Trust Company, and no cash on hand; total \$473.89.

3. The Committee recommends that the Section of Clinical Psychology, and each of such other Sections in applied psychology as shall hereafter be recognized by the American Psychological Association, be empowered to establish at its discretion, each a committee of not less than three from its own membership, to receive applications in its field and determine if such an applicant possesses the qualifications for membership in the Section of Consulting Psychologists, with certification thereof. Such sectional committees will be appointed by the President, and such appointment will be authority for the appointees themselves to be certified as above, upon application during their term of office.

4. The function of such Sectional Committees is understood to be to determine whether the requirements for certification are met by the individual applicant. Under the appointment of such a sectional committee the essential function of the Committee on Certification of Consulting Psychologists will be to define as objectively as practicable the requirements for certification in the various fields and to keep these requirements commensurate. The authority for the issue of a certificate by the Committee on Certification, is the recommendation of an applicant by a Sectional Committee. It is recommended that all certificates of the present level be in a single form, and issue from a single office.

5. That the Committee on Certification of Consulting Psychologists be made up from at least one member from each of the said Sectional Committees if established, with as many members at large as may be required to bring its total membership to its authorized number, which is at present five. So far as practicable, members at large shall be so chosen as not to give one participating Section a plurality over another in the membership of the Committee on Certification of Consulting Psychologists.

6. That the funds now charged to the Committee on Certification be turned over to the Treasurer of the American Psychological Association, and that future receipts and disbursements under the certification program be through this channel.

7. That Sectional Committees in clinical, educational and industrial psychology, established as contemplated in paragraph 3, and the Committee on Certification of Consulting Psychologists be granted the use each of one hundred dollars of the funds named in paragraph 6, as a revolving fund.

8. That all and only such moneys as are now or hereafter received on account of the certification program, shall be devoted to the expenses of such program.

9. That of the initial fee paid in by an applicant through a Sectional Committee on account of certification, the sum of five dollars be credited to the Committee on Certification of Consulting Psychologists, and that the balance of fees paid in stand to the credit of the Sectional Committee responsible for passing upon the application.

10. That the funds accruing as above, be expended under the direction of the executives of the several committees.

11. In case of any action by the Association, rendering the membership of the present Committee on Certification inconsistent with the provisions of

this report, it is recommended that the present Committee be discharged, and a new Committee appointed by the President whose membership shall be in accord with the governing regulations.

12. The Committee has from time to time raised the question of certification representing a less advanced level than the certificates now issued. Under the recommendation of this report, this is a matter for the Sectional Committees. The present Committee accordingly recommends that such Sectional Committees as may be concerned with the application of psychometric methods, consider the advisability of certifying accomplishments junior to the present requirements, and not necessarily involving membership in the American Psychological Association.

Respectfully submitted,

F. L. WELLS,

*Executive Officer*

November 15, 1923

#### REPORT OF THE COMMITTEE ON TERMINOLOGY

This Committee was authorized at the 1915 meeting of the Association, its duty being "to consider the matter of uniformity in the usage of psychological terms."

The Committee decided to proceed at first with the more fundamental terms used in psychology and to include as many alternative definitions (or delimitations) of any terms as are sanctioned by good usage. The first list was completed in time for the 1917 meeting and published in the *PSYCHOLOGICAL BULLETIN* in March, 1918. The definitions therein contained were agreed to unanimously by the Committee as fulfilling the prescribed conditions.

Since the work was done mostly by correspondence and involved an incredible amount of time and labor, it was decided to form two subcommittees of two members each to prepare tentative definitions, which were to be submitted to the whole Committee for final revision. The war put a stop temporarily to the work, but the report of one subcommittee was presented at the 1921 meeting and was printed in the *PSYCHOLOGICAL BULLETIN* in April, 1922. The second subcommittee has not yet been able to reach an agreement on the terms assigned to it.

The first subcommittee then took up another set of terms and is in a fair way to reach an agreement upon them. Your Committee asks the privilege of printing this third report upon its own responsibility, provided an agreement as to the wording can be finally reached.

Your Committee is not agreed as to the advisability of continuing its work. The chairman is personally of the opinion that the results obtained are scarcely commensurate with the labor involved, and that some other way of attaining the desired end might be better.

In view of these facts your Committee asks the Association to determine whether it wishes to discharge the Committee and give up the work, or to proceed under a new committee or with such changes in personnel as may seem desirable.

HOWARD C. WARREN,

*Chairman*

December 5, 1923



REPORT OF THE COMMITTEE ON THE RELATION OF THE ASSOCIATION  
TO PUBLICATION

The Committee begs to report that in pursuance of the instructions given it at the 1922 meeting of the Association, an option for the purchase of the Psychological Review Company's stock, on the terms proposed by Professor Warren and agreed upon by the Association at the 1922 meeting, has been signed by Professor Warren and the Secretary of the Association, and deposited with the Secretary. No further business was entrusted to the Committee.

Respectfully submitted,

HERBERT S. LANGFELD  
SHEPHERD IVORY FRANZ  
MARGARET FLOY WASHBURN,

November 16, 1923

*Chairman*

SUPPLEMENTARY REPORT OF THE COMMITTEE ON THE RELATION OF  
THE ASSOCIATION TO PUBLICATION

After the report of our Committee had been sent to the Secretary, Dr. Cattell sent us a request to meet the Committee on Abstracts of the Division of Anthropology and Psychology of the National Research Council. Accordingly a meeting was held at the offices of the Psychological Corporation in New York, on the morning of December 1. There were present Dr. Cattell, Professor Jenks (chairman of the Division), Dr. Yerkes, and Professor Boring, for the Division; and Professors Langfeld and Washburn of the Psychological Association's Committee on Publications.

The discussion turned upon the best method of securing support for an abstract journal. The members of the National Research Council present could give no assurance that funds could be secured through the Council. They were, however, of the opinion that a necessary preliminary to any attempt at such a proceeding would be a declaration on the part of the Psychological Association that it purposes to take up the option which has been accepted from Professor Warren, as soon as this shall be financially possible; and they regarded it as highly desirable that the Association should appoint a committee to consider plans for the financing of the enterprise. Accordingly Professors Langfeld and Washburn undertook to suggest to the Council the desirability of asking the Association at the coming meeting to vote a definite intention of taking up the option when this should be made possible, and the appointment of a committee on ways and means.

This report is to be considered supplementary to the report already in the hands of the Secretary.

Respectfully submitted,

HERBERT S. LANGFELD  
MARGARET FLOY WASHBURN,

December 3, 1923

*Chairman*

## REPORT OF THE COMMITTEE ON CHECK LISTS OF PSYCHOLOGICAL BOOKS

In conformity with your vote of last year approving the report of this Committee, about eighty-five letters were sent to the psychologists of colleges and universities requesting them, (1) "to designate a topic or topics in which their library might with advantage concentrate its efforts by purchasing rare and old books and all important new books as issued"; (2) "to urge the respective libraries to send duplicate cards of their card catalogue to the Library of Congress"; and (3) to give full coöperation in loaning desired books to other institutions.

To these eighty-five letters some thirty replies have been received. About one-third of these replies, from smaller colleges, are relatively negligible; of the others some enthusiastically agree to concentrate on certain topics; others are favorable but seek further information and suggestion; others still are somewhat skeptical. The queries concerning the feasibility of such concentration of effort referred chiefly to the necessity of first securing in the libraries an adequate collection of books on general psychology, to the problem of expense, and to the varying interests of shifting personnel in the psychological departments. In all the replies only secondary attention, if any, was given to the suggestions about depositing duplicate cards in the Library of Congress, and the loaning of books to other institutions.

The Committee's work cannot be finished until a more adequate number of replies to its letter has been received, and until it has full opportunity to correspond individually with those replying. It asks, therefore, that it be continued, with an appropriation of one hundred dollars for the ensuing year for expenses.

The Committee's intentions would be to concentrate on the problem of ascertaining which institutions are specifically strong in certain fields of psychological literature and which would be willing to have it known that they will strive, so far as funds and other exigencies permit, to specialize on some more or less limited field of the literature, regardless of whether the books are old or rare. It will also try, in the interests of those who may wish to look up the history of psychological topics, to find out which institutions possess copies of older and rarer works, and which are specially strong in the literature of fields auxiliary to psychology.

Respectfully submitted,

HOWARD C. WARREN

H. P. WELD

ROSWELL P. ANGIER,

*Chairman*

December 6, 1923

## LIST OF PAPERS

(Arranged Alphabetically by Authors)

1. J. E. Anderson, An Experiment Confirming Heymans' General Law of Inhibition.
2. A. H. Arlitt, Intelligence Tests versus Entrance Examinations as a Means of Predicting Success in College.
3. W. V. Bingham, Intelligence Test Scores and Business Success.
4. B. T. Baldwin and L. I. Stecher, A Psychological Study of Some Rural Children.
5. C. Bird, The Relative Importance of Maturation and Habit in the Development of an Instinct.
6. P. Blanchard and R. H. Paynter, Some Findings in the Clinical Study of Five Hundred "Problem" Children.
7. E. A. Bott, Differences Between Reciprocating and Nonreciprocating Voluntary Movement of the Wrist.
8. W. Brown, The Reliability of the Order of Merit Method.
9. C. W. Darrow, The Effect of Bodily Attitude on Verbal Association.
10. E. Faris, The Problem and Method in Social Psychology.
11. S. W. Fernberger, The Thresholds for Range of Attention, Cognition, and Apprehension.
12. T. R. Garth, Mental Fatigue of Indians of Nomadic and Sedentary Tribes.
13. R. H. Gault, Experiments in Tactual Interpretation of Oral Speech.
14. C. R. Griffith, The Effect of the Inclination of the Head on Eye-Movement.
15. C. L. Hull, Multiple Prediction of Vocational Aptitudes by a Machine.
16. G. Humphrey, The Theory of Einstein and the Gestalt.
17. W. S. Hunter, The Nature of Consciousness.
18. Joseph Jastrow, The Neurological Concepts of Behavior. (Symposium.)
19. G. H. Kent, Sources of Error in the Use of Statistical Methods for Individual Study.
20. H. D. Kitson, A Statistical Study of the Personality of Workers in the Metal Trades.
21. W. M. Klise, A Comparison of Intelligence Test Records with Various Criteria of Scholastic Success.
22. F. B. Knight, The Reliability and Validity of Estimates of Character Traits by Measurements of Physical Characteristics.
23. C. Landis, Facial Expression of Emotions.
24. H. S. Langfeld, The Problem of the Restless Worker.
25. K. S. Lashley, The Neural Mechanism of Voluntary Movement.
26. K. S. Lashley, The Physiological Analysis of the Drive versus the Libido. (Symposium.)

27. J. H. Leuba, The Nature of Subconscious Activity as Seen in an Instance of Scientific Inspiration. (Symposium.)
28. J. A. Melrose, The Structural Analysis of Human Thinking.
29. J. T. Metcalf, The Pleasantness of Brightness Combinations.
30. M. F. Meyer, Special Ability Tests as Used in Missouri; including a demonstration of a Typical Test.
31. M. Miller, The Effect of Relaxation Upon the Involuntary Response to an Electric Shock.
32. F. G. Mueller, The Relation of Individual Associative Responses to Other Variations in Behavior.
33. K. Murdoch, A Study of Mental Differences Which Are Due to Race.
34. F. C. Paschal, An Anthropological and Psychological Analysis of Mexican School Children in Tucson, Arizona.
35. Joseph Peterson, Intelligence Conceived as a Mechanism.
36. E. S. Robinson, Results of Variations in Length of Memorized Material (II).
37. J. G. Rockwell, The Relation of Thyroid Deficiency to Learning in the White Rat.
38. Curt Rosenow, The Position of Meaning in Behaviorism.
39. C. C. Ross, Relation Between Grade School Record and Later School Achievement.
40. Max Schoen, The Nature of the Aesthetic Attitude in Music.
41. I. C. Sherman, The Suggestibility of Normal and Defective Children.
42. F. O. Smith, The Determination of a Scale of Discriminable Purples.
43. G. S. Snoddy, An Experimental Analysis of the Learning Process as an Approach to Physiological Psychology.
44. Lewis M. Terman (Address of the President), The Mental Test as a Psychological Method.
45. L. L. Thurstone, The Influence of Freudianism on Theoretical Psychology. (Symposium.)
46. L. L. Thurstone, Psychology in the Civil Service.
47. M. J. Van Wagenen, A Comparison of the Mental Ability and School Achievement of the Bright and Dull Pupils in the Sixth Grade of a Large School System.
48. R. Walter, A Course in Psychology for Secondary Schools.
49. L. W. Webb, Comparison of Student and Faculty Judgments of Intelligence.
50. A. P. Weiss, Biophysical versus Biosocial Equivalence in Human Behavior.
51. F. L. Wells, The Scientific Aspects of Certification.
52. W. R. Wells, Experiments in Waking Hypnosis for Instructional Purposes.
53. R. S. Woodworth, Four Varieties of Behaviorism and the Lack of Inherent Connection Between Them.
54. P. T. Young, The Foundations of Psychology.

ABSTRACTS  
GENERAL PSYCHOLOGY  
PROGRAM A

THURSDAY, DECEMBER 27, 9:30 A.M.

*The Foundations of Psychology.* PAUL THOMAS YOUNG, University of Illinois.

The basic assumption of physical science is that there exists a real world describable in terms of molecules, atoms, electrons, fields and similar concepts. This assumption is not universally valid as an explanation of experience; it must be supplemented by the assumption of the psychologist that experience, as it is given, depends for its existence upon bodily, and especially upon nervous, conditions.

Where the behaviorist holds consistently to the standpoint of physical science his program is straightforward; but it does not touch many interesting and significant problems which presuppose the psychological point of view.

The psychologist would do well to take up a standpoint similar to that of Avenarius. From this standpoint the analysis of phenomena, as they are given, reveals two factors. (1) There are contents which always present a configuration. The configuration, or patterning, depends upon physical conditions outside of the observing organism and also upon physiological conditions. (2) The phenomena of meaning primarily depend upon physiological conditions. The study of meaning in relation to observation and to behavior constitutes a fundamental problem for the psychologist.

*The Nature of "Consciousness."* W. S. HUNTER, The University of Kansas.

An attempt is made to formulate empirically the nature of "consciousness" as a phenomenon coming within the realm of scientific study. Previous psychologists, both behaviorists and subjectivists, have pointed out the close connection between "consciousness" and language. The present contribution does not attempt to identify the



two phenomena nor does it seek to ignore "consciousness." It starts from two typical and critical cases of the arising of new "consciousness" in man and arrives at the conclusion that "consciousness" is one type of stimulus-response relationship.

When through practice a decreased intensity of stimulation leads to a language response, the subjectivist says that the limen of "consciousness" has been lowered. When through practice a language response is made to a single aspect of a complex stimulus, *e.g.*, to an upper partial in a klang, the subjectivist speaks of discriminating the overtone or of becoming "conscious" of the overtone. The present paper, therefore, defines "*consciousness*" as an irreversible SO-LR relationship, where SO stands for sensory process and LR stands for language response. (We do not prejudice the possibility of an LR aroused by some central neural process.) A language response possesses two essential characteristics: (1) it is a symbol; and (2) it can be revived by the organism. The LR is not the "consciousness." "Consciousness of the LR" arises when that language response becomes the initial term in a new SO-LR relationship.

The present conception points the way to many interesting experimental problems. It takes account of the functionalist's contention that "consciousness" possesses unique adaptive value. It avoids dualism and interactionism and their resulting mysticism. Furthermore, it makes the search for "consciousness" in man and animals an experimental rather than a theoretical problem.

A science devoted to the study of the irreversible SO-LR relationship is possible but not desirable. The subjectivists and those depending exclusively upon introspection are involved in a vicious circle of language responses. It is necessary to place the SO-LR relationship in its proper place as *one* of the characteristic manifestations of human nature before it can be seen in correct perspective and studied scientifically.

*Biophysical versus Biosocial Equivalence in Human Behavior.*

A. P. WEISS, Ohio State University.

Psychology does not recognize adequately that *human* responses may be classified in two ways: (a) as *responses* to stimuli; or (b) as *stimuli* for responses in others or in the same individual at a later time. According to (a), which I have named the *biophysical* response (sometimes called the muscle-twitch phase), any two

responses are equivalent to the degree that their sensori-motor effects are equivalent. According to (b), which I have named the *biosocial* response (fairly well described as the "meaning" phase), any two biophysically dissimilar responses are equivalent to the degree that they release a *socially* equivalent response in all individuals of a given social status. To illustrate: Suppose a friend in another city asks me to dinner. I may accept the invitation in at least four different ways: by telegraph, telephone, messenger, or by letter. As sensori-motor effects the four methods are entirely different, but they exhibit an equivalence in the sense that any one of the four cause my friend to telephone his wife that I have accepted. The neuromuscular character of my acceptance may be irrelevant to her in that the various activities associated with the arrangement of the dinner, marketing, preparation, etc., would have been the same under any one of the four ways. Further, the activities of "dining" may assume many alternative neuromuscular forms. There is, however, a *behavior* or *social* equivalence underlying these actions that may be designated as "the giving of a dinner" which cannot be derived from a study of the anatomico-physiological conditions of any of the individuals involved no matter how refined the experimental technique may be. The equivalence can only be derived from a study of the linguistic and social habits of the individuals. It seems to me, however, that it is just these biosocial equivalences which are the measure of human achievement, and in the development of which a mental or conscious factor is most difficult to eliminate.

From the behavioristic standpoint, however, the biosocial response is only the stimulus-response category known as language, which as a stimulus is cumulative in its effects; and relatively independent of the physical environment and sensori-motor organization of the individual. Further, the language response establishes a sort of *sensori-motor interchangeability* between individuals, independently of their spatial or temporal contiguity.

*The Position of Meaning in Behaviorism.* By CURT ROSENOW,  
University of Kansas.

Many psychologists are strongly attracted to behaviorism but are repelled by the mechanistic bias of its prominent exponents. In a previous paper the writer presented a behavioristic point of view which is neither vitalistic nor mechanistic. Lashley's recent paper, "The Behavioristic Interpretation of Consciousness," affords an

opportunity to compare and discuss the two positions. The argument is presented, largely, by discussion of the points of agreement and disagreement.

Points of agreement: (1) The study of states of consciousness is sterile. (2) Psychology should have the same general point of view as physiology. (3) The most important problems of psychology are "the vital problems of human conduct," as enumerated by Lashley.

Points of disagreement: (1) The dragging in of physics and chemistry is irrelevant, except for the bias created. (2) Physiology is not necessarily mechanistic. It has its mechanists, vitalists, and those who are neither. Physiology is interested in every aspect of behavior, psychology only in its meaning if there is one. (3) I object to the acceptance of the introspective account of meaning. Introspection is biased self-observation. Self-observation is legitimate, but the bias must be allowed for. (4) I object to calling the meaning of an act "subjective." Lashley uses the term to mean inaccurate and incomplete description. Therefore both his account and the introspective account is subjective. A better account is possible. Observable and verifiable should be substituted for "objective." (5) I object to Lashley's statement of *the* problem of psychology, as follows: ". . . to find in the physical world deterministic relations between nonqualitative discrete entities in time and space" and would substitute the following, "The problem of psychology is to give an adequate, correct, and verifiable account of the meaning of behavior."

Solution of the problem: Behavior is essentially organic. It develops and has a history. Analysis into partial meaningful activities is useful in gaining a more complete understanding of its meaning but the most powerful method is the tracing of its history. The correct meaning of behavior can often be found with a minimum of physiological detail. Assuming the evidence on which a solution is based to be verified, further verification is based upon the subsequent development of the behavior. If the position of this paper is accepted, investigations in human psychology will tend toward a mixture of experimental and observational technique with less emphasis on the purely experimental.

*Four Varieties of Behaviorism and the Lack of Inherent Connection Between Them.* R. S. WOODWORTH, Columbia University.

The four varieties are:

(1) Simple insistence upon the value of behavior study, and perhaps on the superior cogency of objective as against introspective evidence.

(2) Rejection of introspection as an unreliable form of observation, with the insistence on the removal of introspective concepts from the science.

(3) Emphasis on a neuromechanistic interpretation of all psychological data.

(4) Emphasis on the study of behavior in the sense of social conduct.

## GENERAL PSYCHOLOGY

### PROGRAM B

THURSDAY, DECEMBER 27, 10:45 A.M.

*The Nature and the Aesthetic Attitude in Music.* MAX SCHOEN, Carnegie Institute of Technology.

Confusion in aesthetic discussion is due in the main to a failure to distinguish between such terms as *beauty*, *aesthetic*, *admiration*, *appreciation*, *criticism*. Since music has been called the measure of all arts, these terms are examined in this paper in the light of that art. Types of listeners to music that have been experimentally established are discussed as to their relative aesthetic significance with theoretical, empirical, and experimental aesthetic data as criteria of evaluation. On the basis of this evaluation distinctions and relationships between art terminology are established.

*The Theory of Einstein and the Gestalt.* GEORGE HUMPHREY, Wesleyan University.

The theory of the Gestalt and the relativity theory of Einstein appear to contain a parallel which is noteworthy and seems to have escaped the notice of workers in both fields, including even so acute a psychophysical thinker as Köhler.

Starting with a criticism of what Wertheimer terms the "bundle," "mosaic," or "and-combination" hypothesis, and following von

Ehrenfels, the school of the Gestalt has developed the notion of a psychic structure which is "more than" the sum of its parts, is not "summative," and is composed of interdependent members, each of which derives its nature from its place in the whole. According to this theory, the sensation is an abstract artefact, which has been falsely exalted to the rank of a primitive datum.

The fundamental conception of Einstein is that motion can only signify the changing position of bodies relative to each other (Haldane). This is the sole sort of physical change of which we have experience. By developing a calculus which does not rest on the Newtonian assumption of a fixed frame of reference, but which deals with "change in which space and time have not yet been discriminated," Einstein claims to have approximated more nearly the actual facts of experience than his predecessors. "Space and time are really abstractions from reality" (Haldane).

In addition to the general similarity of the thought, certain specific correspondences present themselves. Both schools claim that the fundamental framework of their respective predecessors is an abstraction, and that results better approximating known facts may be obtained by starting from the actual data of observation. Both claim to deal with "wholes" (Whitehead for the physicists), "more or less definite wholes" (Wertheimer for the Gestalt school). Both claim that the members of these wholes have been combined in the older treatment by a spurious addition which does violence to the facts. ("The theorem of the addition of velocities employed in classical mechanics cannot be maintained," Einstein; and on the other hand the Gestalt is "not to be regarded as the sum of single excitations," Koffka and passim.) There are many other parallels, springing from a similar method of attack in both cases.

*Intelligence Conceived as a Mechanism.* JOSEPH PETERSON, Peabody College.

Animistic theories of intelligence assume some degree of interference with or control of behavior by forces outside the system of nature. Vitalism that does not simply stand for a possible mode of intraorganic stimulation in complex organisms yet undiscovered, is objectionable on the same ground as is animism.

Mechanistic conceptions of intelligence based on associationism have not succeeded in giving an account of the higher, more analytic functions, and they have of late met serious difficulties with the



learning process. Associationism, which conceived of neural functioning largely as a piecemeal process of different units, each thrown into excitation either by direct stimulation or by neighboring units so excited, is failing to stand up under experimental tests. Only in the simplest cases of arousal by contiguity do expectations based on frequency and recency factors hold good, if at all. Even the rat in the maze gives serious trouble to the pure associationist, whose laws seem only to fix the "errors"; and the pleasure-pain supplement seems to offer nothing but further difficulties. Experiments show not only that learning constantly violates expectations based on the laws of association, but also that learning may go on mostly unhindered in situations designed to make frequency and recency influences obstructive to it. A consideration of intensity factors does not remove these difficulties.

Since we cannot consistently regard intelligence as a force that effects the reconstruction in learning and in other intelligent behavior, we must conceive of it as a biological mechanism by which a complexity of impulses are given somewhat unified and consistent direction in behavior. These impulses are, of course, the effects of various stimuli, both inner and outer, direct and indirect, and it is the situation itself—inner metabolism and external conditions—that forces the adjustment in learning and in thinking. We must postulate inhibitions and facilitations among a hierarchy of neuromuscular systems, by means of which present stimuli may be resisted and behavior made to follow directions of general consistency. But hereditary organization of inconceivable complexity, shaped by the environment of remote ancestors, also exerts controls on behavior, largely by inter-stimulation of part-processes in the organism itself. The resistance that we feel ourselves offer against external controls, as manifested in attention and volition, is thus to be understood. Freedom as a practical condition is undeniable, but it is determined by intelligence and training, and is not incompatible with predictability.

*The Scientific Aspects of Certification.* F. L. WELLS.

General considerations governing the control of standards in applied psychology. Dual aspects; the fixing of standards, and the determination of what individuals meet the standards. Standards illustrated in the present Section of Consulting Psychologists. Issues presented: who may apply for certification; the question of senior

and junior levels of certification; the question of certification specific to different departments of applied psychology. Relation thereto of the existing Section of Clinical Psychology, and of future sections, such as for education and industrial psychology. Administrative factors involved.

## EXPERIMENTAL PSYCHOLOGY

### PROGRAM A

THURSDAY, DECEMBER 27, 2:00 P.M.

*An Experimental Analysis of the Learning Process as an Approach to Physiological Psychology.* GEORGE S. SNODDY, University of Utah.

The learning process as found in a type of trial and error learning has been submitted to intensive experimental analysis. The type of learning is mirror tracing with an apparatus similar to that employed by the author in previous investigations, Psych. Rev. Mon. Sup. No. 124. This coördination can be built up in various ways, each of which gives us insight into the physiology of the process. Three methods are presented here.

(A) A very low rate of learning comes from series practice (no time intervals between circuits) at the beginning of practice. An experimental asymptote is reached in this plan at the sixtieth circuit, the efficiency at this point being 50 per cent of maximum.

(B) If, at the limit of improvement in early series practice, short time intervals are inserted between circuits learning is reinstated and proceeds to a maximum of twice the efficiency of plan A. If no time intervals occur between circuits no improvement at all takes place. This is utilized to study the relationship between the time and errors. Series of many circuits are made with instructions on avoiding errors or making speed varied from circuit to circuit. It is found that time in seconds plus errors = a constant for any learning level. This is our raw score.

(C) If at beginning of learning time intervals are inserted between circuits a high rate of improvement takes place which is a function of the length of the time interval. The rate of improvement drops off rapidly at twenty circuits; the efficiency is then higher than that for series practice at sixty circuits.

Plans A and B give learning curves with an equation of the form  $y = kx^{-n}$  where  $y$  is the raw score  $= T + E$ ,  $x$  is the number of circuits and  $k$  and  $n$  are constants. The equation is shown to be exact, not an approximation. Upon analysis this is seen to be the equation for a gas undergoing adiabatic change of state, where  $y$  represents the pressure and  $x$  the volume. Analyses which cannot be detailed here seem to show that this coördination is built up through the increase in density of the colloids of certain synapses. Such physical changes are shown in the physical chemistry of the colloids to follow the gas laws.

Individual differences both as to  $k$  and  $n$  are very great. A study of over a thousand cases about half of whom are inmates of a state mental hospital shows that deficiency in either  $k$ , the initial adaptation, or  $n$ , the rate of improvement, has a definite clinical significance. They become excellent diagnostic devices for arriving at a definite form of neural instability, the basis of the psychopathic mental conditions.

*Results of Variations in Length of Memorized Material (II).* E. S. ROBINSON, The University of Chicago.

This experiment, which was carried out with the assistance of Mr. Chester W. Darrow, is an attempt to test the results of a recent study published by Professor William T. Heron and the speaker in the *Journal of Experimental Psychology*, Vol. V, 1922, pages 428 to 448. The present experiment is similar in plan to the earlier one. Lists of varying length were learned by the *anticipation* method and the interval between learning and relearning was spent either in learning an interpolated list or in *resting*. The principal differences between this and the previous experiment lie in the facts that three-place numbers were employed here instead of nonsense syllables, and that a new group of subjects served.

#### I. Length of Material and the Memory Curve:

The curves of memorizing for lists of 4, 6, 8, and 10 three-place numbers are of the negatively accelerated form so typical of learning in general. In the early stages of memorizing more absolute units of the shorter lists are acquired per absolute unit of study time than of the longer lists.

#### II. Length and Difficulty:

With increasing length the difficulty of the lists increases at an increasing rate. This is shown by the definite positive acceleration

obtained when absolute time required to learn is plotted against length.

### III. Length and Amount Retained:

After fifteen minutes of rest, relatively more of the longer lists was recalled than of the shorter.

### IV. Length and Susceptibility to Retroactive Inhibition:

For lists containing from 6 to 10 numbers there is generally a decreasing susceptibility to retroactive inhibition with increasing length. There seems to be a lower limit to this relationship, however. Lists of 4 numbers are frequently less affected by retroactive inhibition than are lists of 6 numbers.

The above results are in almost perfect accord with the results of our previous experiment.

*The Neural Mechanism of Voluntary Movement.* K. S. LASHLEY, University of Minnesota.

The current view that the precentral gyrus or so-called motor cortex forms the efferent path for impulses to voluntary movement has been tested experimentally. Monkeys were trained in the manipulative movements of opening various latch-boxes. The entire motor cortex of both hemispheres was then mapped by faradic stimulation and extirpated. The animals were kept without further training until the paralysis following operation had disappeared. Their retention of the manipulative habits was then tested and was found in every case to be unimpaired by the loss of the motor areas. The experiments show that the efferent paths from the cortex which are chiefly concerned in conditioned reflexes must lie outside of the pyramidal tracts.

The paralysis following lesions in the precentral gyrus may be temporarily overcome by emotional facilitation. This suggests that, in addition to regulation of postural reflexes, a primary function of the motor cortex is the facilitation of lower motor centers.

Records of tongue-movements in man by a new method indicate that in internal or overt speech movements of the tongue are conditioned by similar facilitation.

Such considerations lead to the view that voluntary movement involves a primary facilitation mediated by the postural mechanisms of cerebellum, striatum, and precentral gyrus. The substratum of tonic innervation thus established increases the excitability of the

final common paths so that impulses to habitual movements descending through extrapyramidal tracts may arouse overt movement. This mechanism provides a neurological basis for the psychological conceptions of "*Aufgabe*," "set," and the like.

*The Effect of the Inclination of the Head on Eye-movements.* C. R. GRIFFITH, University of Illinois.

The character of the eye-movements and the description of the accompanying states of consciousness set up by rotation about a horizontal plane (excitation of the horizontal canals) have now been pretty well standardized. This paper describes an initial step in the study of the eye-movements and of the states of consciousness set up by the excitation of one pair of the vertical canals. A standard rotating chair was equipped with a special device for holding the head in various fixed positions during and after rotation. Under these conditions measurements were made and introspective accounts given which show that aside from the effects of practice nystagmus and "dizziness" vary in a fixed manner with variations in the inclination of the head. An intimate relation was discovered between different forms of eye-movement under rotation that was not quite adequate to excite a single pair of canals. At certain angles the horizontal movements resulting from stimulation of the horizontal canals run over by imperceptible gradations to the circular movements which result from stimulation of the vertical canals. An attempt has been made to furnish an adequate description (a) of these changes in the character of the eye-movements, (b) of differences in nystagmus time under varying inclinations of the head, and (c) of qualitative changes in the accompanying states of consciousness.

*Differences Between Reciprocating and Nonreciprocating Voluntary Movement of the Wrist.* E. A. BOTT, University of Toronto.

From published data on the nature of reciprocal wrist movement under maximum voluntary effort (*Brit. Journ. of Psych.*, July, 1923) the following three facts are known: (1) In reciprocally flexing and extending the wrist to reproduce a standard length of stroke visually presented, a subject produces long and short strokes in an erratic order. (2) Long and short strokes are always nearly of equal duration, the difference in their length being almost entirely due to the difference in their progression rate, *i.e.*, long strokes are long because the limb was moving rapidly, while short strokes are



those of slow rate. (3) The progression curve (proportion of stroke distance to proportion of stroke time) is identical in form for the long and short strokes in a given reciprocal series of strokes, showing that the character of acceleration (positive and negative) throughout any stroke is typical once the stroke is initiated. The differences which exist in the progression rate of successive strokes is therefore due to causes affecting only the initiation of the stroke.

Thus from the fact that the difference in stroke lengths is really the difference in their characteristic progression rate, while this in turn is fully predetermined as soon as the stroke has started, it would appear that the variation in the length of individual reciprocal strokes depends in some way upon the preceding stroke in the series. The present communication deals with the nature of this dependence between successive reciprocating strokes. The facts to be presented cover two points: The first point is a comparison between the progression curve of strokes which are reciprocatory (*i.e.*, which have a conditioning predecessor) and that of nonreciprocal strokes under the same conditions but taken from a "standing start." The evidence points to an "overlapping" action of reciprocal strokes—contrary to an interpretation sometimes given of "reciprocal innervation." In the second place the data afford some surprising facts about non-reciprocating strokes taken with light, medium and heavy loads, *viz.*, that the initial rate of motion which can be voluntarily given a limb starting from rest is greater the greater the load and that this is to a certain degree true even though the subject does not know what load is to be given him, if any.

*The Relative Importance of Maturation and Habit in the Development of an Instinct.* CHARLES BIRD, University of Minnesota.

The assumption has been made that early development of behavior is due to physiological maturation rather than to the effects of practice. The available experimental evidence for this seems questionable. Recently the writer completed a preliminary investigation of the development of the pecking reactions of the chick, similar in broad outlines to the early work of Breed. In this preliminary study a small number of chicks were forced-fed during periods ranging from ten to twenty days. Each day they were tested for the accuracy of pecking by recording the number of successes in twenty-five attempts to seize grains under controlled conditions. When not on the test table the chicks were kept in large brooders which pre-

vented their feeding but did not impede other activity. No attempt was made to keep them from pecking at the wires of the brooder, or from preening, which frequently involves pecking, but no opportunity for pecking at food was given. They were not confined in a dark room. Records of accuracy, of time required to make the responses and of body weight were kept; the latter to afford a slight check on physiological condition and to guard against the contention that maturation could not proceed because of malnutrition.

In these chicks, kept without practice, initial accuracy was low and the succeeding trials yielded results comparable to those obtained from normal two-day-old chicks. Little improvement in accuracy appeared during the period of the tests, despite the freedom permitted the chicks which we might expect to facilitate maturation. However, when allowed to feed normally these forced-fed chicks rapidly approximated the accuracy of average chicks their own age. These observations, together with those on the early development of feeding reactions in chicks kept under more normal conditions, indicate that "maturation" will not account for the improvement in accuracy observed in normal development, but that where this improvement occurs it is due to practice of the function.

## EXPERIMENTAL PSYCHOLOGY

### PROGRAM B

THURSDAY, DECEMBER 27, 3:30 P.M.

*Experiments in Tactual Interpretation of Oral Speech.* ROBERT H. GAULT, Northwestern University.

The subject associates a tactual stimulation upon the hand arising from the speaker's utterance at his end of the tube with a visual stimulus: the word or sentence spoken.

In the course of 78 sittings, he learned to distinguish 34 isolated words and any number of sentences composed of groups of these words. The stimulus words were selected with a view to their vowel values and consonantal combinations.

Scoring was made on the basis of the number of words correctly identified. At the end of May the subject had attained an accuracy of 94 per cent; after a period of no practice since May he was 71 per cent accurate when there were 200 chances for error.

We have substituted a telephonic apparatus for the speaking tube. We are using the transmitter of a Multiacousticon, a two-stage amplifier and a Type C unit. The subject holds the earpiece of the apparatus in his hand enclosed in a sound-proof box. The speaker at the transmitter is 75 feet away in a separate building.

An appropriate pedagogical method has been devised. In ten sittings the subject had learned to identify four sentences, unaided by an amplifier. The identification of isolated words proved to be a more tedious matter. The sentences gave the subject the advantage of tempo and emphasis.

The top of the index finger was held tightly against the vibrating diaphragm, at the outset. In this case the subject learned to distinguish sentences but the impulses corresponding to isolated words gave no sign of breaking down so that they separately could be identified.

Later the earpiece was held in the hand with the aperture disclosing the diaphragm next to the palm. In this case not only sentences but words, after practice, could be identified.

The second method evidently has the advantage in that it provides a pattern of stimulation upon the palm, and avoids damping the vibration of the diaphragm.

The amplifier enables us to get distinct impacts upon the skin, and facilitates the breaking up of the tactual impression corresponding to each word: a condition that is indispensable to learning.

*The Determination of a Scale of Discriminable Purples.* FRANKLIN O. SMITH, University of Montana.

Methods of the determination of a pure hue scale and retinal sensitivity to hue differences have been suggested by Steindler, Jones, and Nutting. Jones, reporting an investigation from the research laboratory of the Eastman Kodak Company, determined for the entire range of visible radiation, the relation existing between the wave length unit and the least perceptible color sensation difference. From this data he was able to plot the sensibility curve of the retina to hue differences. By the integration of this sensibility curve, the scale reading curve necessary for the establishment of the fundamental hue scale was obtained.

Since purple cannot be measured directly in wave length units, Jones devised a method of measuring the complementary of purple and deducing from these readings the sensibility for purple.

In reading these results one is compelled to ask whether the just perceptible hue differences in the components of a given purple are equivalent to the just perceptible differences in the purple itself. This is the question that the present paper undertakes to answer.

It is essential, for the present purpose, that a mixture of monochromatic lights of known purity be obtained and that measurements of the just perceptible differences of the components and also of the mixture be made.

A secondary object of this research is to test the utility of the Wrattan color filters made by the Eastman Kodak Company for the measurement of color discrimination. The filters are thoroughly standardized, having been tested spectrophotometrically and the density curves plotted.

From these curves the per cent of purity is determined and tabulated.

Red and blue filters are arranged in pairs, each pair consisting of a red and a blue filter. From the mixtures produced by passing beams of light through these upon a right-angled reflecting wedge varying degrees of reddish and bluish purple can be obtained depending upon the relative intensity of the light sources employed.

Data will be presented to show the relative sensitivity of the normal eye to red and blue and to purple.

*An Experiment Confirming Heymans' General Law of Inhibition.*

JOHN E. ANDERSON, Yale University.

In 1899 Heymans formulated a "general law of inhibition" to the effect that the inhibitory power of a stimulus measured by the stimulus whose effect it can just completely inhibit, increases in direct proportion to its intensity. He demonstrated this law for vision by a large number of experiments on a single subject and also for a number of other sense fields. He pointed out that Weber's law is a special case under the general law of inhibition. Spencer, working in the Yale laboratory, has recently confirmed Heymans' law by showing that the simple threshold for light in the albino rat is also a linear function of the intensity of an inhibiting stimulus.

In the experiments described here, the differential threshold for brightness in the presence of five intensities of an inhibiting stimulus was obtained on human subjects by a method somewhat different from that of Heymans. The results show that the differential threshold is a linear function of the intensity of an inhibiting stimu-

lus, thus affording further confirmation of Heymans' important principle.

*The Thresholds for Range of Attention, Cognition and Apprehension.*

SAMUEL W. FERNBERGER, University of Pennsylvania.

Stimuli consisting of a varying number of black dots on a white background were exposed for less than forty sigma in a Whipple tachistoscope. The subjects were instructed to report (1) number of dots; (2) degree of certainty on a five-point scale; and (3) an introspective characterization of the mental processes employed. These were of three sorts: (1) an immediate process in which all elements appeared with equal clearness (attention); (2) an immediate process in which, however, there were clearness groupings (cognition); (3) a process involving a subsequent reimagining and counting of the stimulus dots (apprehension). Curves for all three introspective groupings turned out to be of the ogive form. The thresholds were calculated and were considerably different—the magnitude being in the order named. Progressive practice increased the limens for cognition and for apprehension. The limen for attention remained relatively constant throughout the experimental series.

*The Pleasantness of Brightness Combinations.* JOHN T. METCALF,

University of Vermont.

A good deal of attention has been given to the question of the pleasantness of combinations of colors, but comparatively little to that of the pleasantness of combinations of different shades of the colorless series. Experimental results indicate that the esthetic value of different combinations varies considerably with different brightness relationships between the components. Results differ as to which combinations produce the most pleasing effects. For the purpose of studying this problem a series of stimulus cards was made up as follows: Each card consisted of a three-inch square of some shade, in the center of which was mounted a one-inch square of a different shade. In all five shades were used: white, black, and three greys, one light, one medium, and one dark. When all possible combinations of these were made, twenty cards resulted. These twenty cards were presented to the subjects individually by the method of paired comparison, so that in the course of the experiment each card of the twenty was judged in comparison with every one of the others. The results obtained indicate that, with certain



exceptions, medium differences in the brightness of the components are more pleasant than slight differences or extreme differences. Some of the latter combinations were called definitely unpleasant by the subjects. Rather significant individual differences appeared, not only in the number of times certain combinations were preferred, but also in the quickness, ease, and certainty with which the subjects made their judgments.

### SESSION FOR INFORMAL REPORTS BY GRADUATE STUDENTS

FRIDAY, DECEMBER 28, 9 A.M.

*A Course in Psychology for Secondary Schools.* RALPH WALTER, Harvard University, introduced by W. F. Dearborn.

*The Structural Analysis of Human Thinking.* J. A. MELROSE, University of Wisconsin, introduced by V. A. C. Henmon.

*The Effect of Relaxation Upon the Involuntary Response to an Electric Shock.* MARGARET MILLER, University of Chicago, introduced by Harvey A. Carr.

*Facial Expression of the Emotions.* CARNEY LANDIS, University of Minnesota, introduced by K. S. Lashley.

*The Effect of Bodily Attitude on Verbal Association.* CHESTER W. DARROW, University of Chicago, introduced by Harvey A. Carr.

*The Relation of Individual Associative Responses to Other Variations in Behavior.* FRED G. MUELLER, University of Wisconsin, introduced by Clark L. Hull.

*The Relation of Thyroid Deficiency to Learning in the White Rat.* JOHN G. ROCKWELL, University of Minnesota, introduced by Harvey Carr.

*The Suggestibility of Normal and Defective Children.* IRENE CASE SHERMAN, University of Chicago, introduced by Harvey Carr.

*Comparison of Intelligence Test Records with Various Criteria of Scholastic Success.* MIRA M. KLISE, Iowa State College, introduced by J. E. Evans.

*The Relation Between Grade School Record and Later School Success.* C. C. Ross, Iowa State College, introduced by J. E. Evans.

## INDUSTRIAL PSYCHOLOGY

FRIDAY, DECEMBER 28, 9:30 A.M.

*Psychology in the Civil Service.* L. L. THURSTONE, Bureau of Public Personnel Administration.

The civil service commissions are primarily interested in examinations and other methods of appointing applicants for positions in the public service and are giving serious thought to the possibility of applying psychological examination methods more extensively in the field of public employment. There are two distinct contributions that psychologists can make at the present time to civil service technique and which will be welcomed by most of the commissions. One of these is the experimental study of intelligence tests in the civil service. It has already been found that intelligence tests are useful in selecting office clerks in the civil service, and the United States Civil Service Commission, for some time, has used an intelligence test for selecting general office clerks.

Another line in which the psychologist can make a contribution to civil service procedure is in the study of the short-answer form of test in those examinations in which knowledge of some subject matter is a requisite. It has been found, wherever experiments have been made, that the short-answer type of test makes it possible to cover a much wider range of knowledge in a given examination time than the older so-called essay, or free-answer, form of tests. The San Francisco Civil Service Commission has adopted the short-answer type of test for most of its examinations.

These contributions are rather specific and they refer exclusively to examination technique. There are other civil service problems in training, promotion, maintenance of an effective corporate spirit, efficiency in government work, examinations to determine temperament and administrative ability of applicants, tests for measuring honesty, and many others which psychology will have an opportunity to assist in solving whenever it has anything worth while to offer. So far, the most conspicuous contributions of psychology have been

in the field of examination technique and these have been very considerable and well received.

*The Multiple Prediction of Vocational Aptitudes by a Machine.*

CLARK L. HULL, University of Wisconsin.

One of the most striking features brought out by the comparison of different batteries of tests designed for distinct vocations, is the extent to which very similar constituent tests appear in each. If a large number of such batteries of tests were given to an individual in an attempt to obtain a comprehensive survey of his vocational potentialities, the repeated giving and scoring of these duplicated elements would amount to a tremendous waste of time and energy. But if all the really distinctive elements found in the various batteries were gathered together into a single superbattery, each element being represented but once, there would result an enormous reduction in the total number of tests given and probably a considerable increase in the precision of prediction. Now an ordinary battery of tests, to yield the maximum of precision of prediction, should have a regression equation showing the optimum weighting which should be given to each individual test. In the same way a regression equation would be worked out which would weight each test in the superbattery so as to yield the highest possible precision of prediction for a given vocation. A second equation would be worked out for a second vocation weighting the *same* test scores in a *different* way so as to yield the highest possible prediction for the second vocation, and so on. There would still remain, however, the labor of solving the rather lengthy regression equations in order to obtain the actual predictions. Even with the best modern aids this itself ordinarily would be a task of several hours for each subject if the vocations were at all numerous. It is believed that this particular difficulty has now been solved. A specially constructed motor driven machine will be shown which, upon receiving a perforated record of the test scores, will give automatically the various numerical aptitude predictions, one after the other, for as many vocations as equations have been provided. The bearing of the general technique outlined upon vocational guidance will be pointed out.

*Intelligence Test Scores and Business Success.* W. V. BINGHAM,  
Carnegie Institute of Technology.

Does outstanding success in business depend primarily on intelligence?

One hundred two business men attending the Babson Statistical Conference at Wellesley Hills took the Bureau of Personnel Research Test VI, a spiral-omnibus form of the Army Alpha intelligence examination. The group was a representative sampling of successful business men: salesmen, sales managers and executives.

The score ranged from 27 to 174; median, 106; interquartile range, 88 to 128. (The maximum possible score on Test VI is 184.) In terms of the army intelligence scale, 83 per cent of these men would be rated A; 12 per cent, B; and 5 per cent, C+ or C, from which it appears that in average performance this group is superior to the army officers tested in 1918. Two of the three lowest scores were made by presidents of their concerns.

To discover possible differences of vocational profile, an analysis was made of the relative proficiency of older and younger executives, sales managers and salesmen, in each of the six types of question included in the test: disarranged sentences, arithmetic, opposites, number completion, analogies, and information. The most significant differences are that the salesmen did better than the executives on disarranged sentences, and less well on arithmetic and number completion. Business men with college training did better upon mixed sentences and opposites than men with less schooling.

Each man who took the test was notified by mail of his score and its meaning, and was asked to fill out an experience record. Of the 102 who took the test, 73 returned experience records. These had made, on the average, better scores than had those who did not respond. Using the data contained in these experience records, ratings of the business success of these 73 men were made by five judges, independently. The extent of agreement among these judges is indicated by the intercorrelation between their ratings: an average coefficient of  $+.60$ .

The combined success ratings, when correlated with the scores on Test VI, give a coefficient of  $-.10$ . In other words, no significant relationship was found between intelligence as measured by the Army Alpha type of mental alertness examination, and relative business success—within this successful group—as estimated from data on a personal history blank.

The correlation between years spent in school and test score is  $+.44$ .

Most of the business men who took this test are far above the average American in intelligence. They are also superior in business

success. Within such a selected group it is not surprising to find that estimated differences of business success do not correlate with intelligence as measured by a brief test. Better criteria of success are required, as well as more severe and thorough intelligence examinations, in order to measure with accuracy the share which mental alertness contributes to accomplishment in business. But the evidence in hand suggests that superiority in intelligence, above a certain minimum, contributes relatively less to business success than does superiority in several nonintellectual traits of personality.

*The Problem of the Restless Worker.* HERBERT S. LANGFELD,  
Harvard University.

The most important problem of vocational guidance is the development of desirable methods for assisting students of high school and college age in the selection of a suitable vocation. It is possible that in the distant future the youths of the country will be so well directed in their choice of an occupation that there will be comparatively little necessity or desire for change. At the present time, however, vocational bureaus are constantly confronted with the difficult task of deciding whether to encourage a discontented applicant in his wish to try some other work. When the applicant has a definite occupation in mind it is often possible to apply a vocational test to determine his fitness for it, but most frequently the situation is complicated by the fact that the individual himself does not know what he wants to do.

Appeal has been made to psychologists for assistance and although in the present stage of vocational guidance one cannot hope to develop a strictly scientific procedure which will yield unequivocal results, it seems worth while in view of the urgency of the request, for psychologists to lend what aid they can to the solution of the problem.

Dr. Starch and the writer are engaged in examining the restless workers who apply to a large industrial union for advice. The paper will describe the methods pursued and the factors which seem most desirable of consideration. A personality study is being made by means of an interview, a questionnaire and one or more intelligence tests. It is the aim of the investigation to develop a standardized interview which can be used by other workers in this field, so that the results from various sources can be compared. In this way the interview can be revised from time to time in the hope that eventually



it will be a useful tool for vocational bureaus. The questionnaire is arranged to supplement the interview by bringing out more clearly the various characteristics of the applicant. The mental hygiene of the restless worker is an important factor and is considered in the arrangement of the interview and in the advice that is given to the applicant. The I.Q. is also helpful, but must often be qualified by the results of an analysis of the quality and quantity of the responses to the questions.

*A Statistical Study of the Personality of Workers in the Metal Trades.* HARRY D. KITSON, Indiana University.

The unusually complete application blanks of a metal trades manufactory enabled the investigator to secure a cross-section of the personality of a group of workers with reference to a number of important questions connected with personnel administration; physical traits; education; length of previous unemployment; reason for change; attitude toward religion, insurance and physical examination, etc.

Since more than 100 of the workers studied were women comparisons are possible between men and women workers in the industry and also with men and women outside the industry.

*The Reliability and Validity of Estimates of Character Traits by Measurements of Physical Characteristics.* F. B. KNIGHT, State University of Iowa.

This study is an attempt to determine the usefulness of so-called character analysis devices in the field of personnel.

a. Three groups of approximately 40 each were chosen. The reliability of the ratings was high. These ratings were used as the criteria.

b. Methods of character analysis now in use were studied. Where definite measurements purport to be related to definite character traits, measurements were made of the members of each group.

c. Character analysis schemes were found to disagree among themselves on the significance of many measurements. This means unreliability of the measures. Of the scores of physical measurements of the groups made, variations in physical traits correlated with our measurements of character traits exactly zero or such variations from zero as pure chance can easily account for.

## SOCIAL AND RACIAL PSYCHOLOGY

FRIDAY, DECEMBER 28, 2:00 P.M.

*The Problem and Method in Social Psychology.* ELLSWORTH FARIS,  
University of Chicago.

If social psychology be defined as the subjective aspect of culture the two main problems are: (1) the analysis of the undivided whole of behavior into the constituent components of culture and physiology; (2) the problem of the mechanism involved in changing one attitude into another, which is the theoretical aspect of all practical efforts to deal with social pathology. The first of these problems is most difficult and the search for method still goes on. There is no doubt of the fact of inheritance but there is great difficulty in discovering its limits.

Several more or less conscious methods may be discovered by a careful reading of current authors. Animal psychology offers relevant facts though the fundamental differences in structure and the total absence of culture limit but do not destroy its value. An uncritical archeology appealing to experience of primitives also appears but more often than not this material is used as explanation and not as concrete data. Modern ethnology with its monographic method is accumulating a wealth of material for the social psychologist. Abnormal psychology is a field whose value is increasingly apparent and when stripped of preconceptions is destined to contribute even more in the future than in the past.

All of these methods, however, are open to the criticism that the subject matter of their science is not the material with which the social psychologist is chiefly concerned. Light from all these is welcome but the real data must be the actual events in the normal life of human beings. In the "Polish Peasant," by W. I. Thomas, is one instance of a method which must be widely used if our problems find solution. Life histories of individuals whose cultural setting is fully known must be studied with a patience and detail not hitherto attempted. The social psychologist must also devote himself with great patience to finding out what there is of scientific value to be had by comparing the works of all the artists, but particularly the writers of biography and autobiography.

*A Study of Mental Differences Which Are Due to Race.* KATHARINE MURDOCH, Castle Memorial, Honolulu.

This study was made in the city and outlying districts of Honolulu in the Territory of Hawaii.

The data consist of:

1. An Experimental Study of School Children.
2. A Questionnaire on Racial Traits.

In the experimental study the subjects consisted of all the twelve-year-old children of specified races who were in the schools examined. This resulted in the following numbers: From the schools of Honolulu from 55 to 60 each, Anglo-Saxon, Hawaiian, Chinese, Japanese, Portuguese, Anglo-Saxon-Hawaiian, and Chinese-Hawaiian (33 subjects only); from both city and country schools from 22 to 32 each, Korean, Porto Rican, and Filipino; from one country school, 56 Japanese.

The results here reported are based upon: information as to grade location, school mark and father's occupation; teachers' estimates of various traits, and their ratings on the Upton-Chassell Citizenship Scale; and results from the following tests, National Intelligence, A and B; Army Beta; Seashore Test for Pitch Discrimination; and a test for deceitfulness.

The questionnaire was answered by twenty-four adults, mostly college professors.

In the treatment of results, race groups are compared by showing the percentage of each race which reaches or exceeds the median of the Anglo-Saxon, after each measure of overlapping has been corrected for the error caused by the unreliability of the test used.

The results suggest the following interpretations:

1. Social status correlates highly with grade location. The two very different Japanese groups emphasize this. Social status should not be equalized for, but the results emphasize the necessity for care in the selection of subjects within the locality studied and for caution in generalizing as to other localities.

2. In general intelligence the Anglo-Saxons probably excel the Orientals, and clearly excel all the other races.

3. The Oriental races, especially the Japanese, do comparatively much better in nonlanguage than in language intelligence tests.

4. Teachers' estimates, results from the questionnaire and one objective test unite in indicating high moral traits in the Oriental races.

5. Teachers' estimates and the questionnaire agree in placing the musical ability of the Hawaiians high. The objective measure shows that in pitch discrimination, Hawaiians do not excel.

6. Race crossing produces offspring with mental abilities between those of the parent races, but more nearly like those of the inferior race.

*An Anthropological and Psychological Analysis of Mexican School Children in Tucson, Arizona.* FRANKLIN C. PASCHAL, University of Arizona, and LOUIS R. SULLIVAN, American Museum of Natural History.

A survey was made of all the nine- and twelve-year-old Mexican children in the public schools of Tucson, Arizona. Slightly over four hundred children were given both the psychological tests and anthropometric examinations. There were about one hundred in each age and sex group. The psychological examination consisted of six individual performance tests. The anthropometric examinations were standard examinations. The principal conclusions are as follows:

1. Approximately 75 per cent of the germ plasm of the Mexicans in Mexico is of Indian origin, but in Tucson approximately only 15 per cent is Indian in origin.

2. The correlations between mental score and individual race characters are very small in a group like this in which the intermixture has taken place for so many generations. Of those chosen, skin color shows the highest correlation with test score.

3. The correlation between characters indicative of physical development and mental development is nearly as great as that between two indices of physical development.

4. Tucson Mexican children born in Mexico have an appreciably higher mental score than Tucson Mexican children born in Tucson. This indicates a more favorable selection of our immigrants from Mexico in recent years. It also indicates that the psychological tests were free from linguistic handicaps.

5. Less sex difference is found in Mexican children than in American children on performance tests.

6. In comparing Mexican mental test results with those of the American standardizations for the same tests, a considerable overlapping is found in the upper half of the distribution in most tests.

From the median downward the American children show an increasing superiority.

7. The difference between American and Mexican children is greater at nine years than at twelve years, indicating the relatively greater part played by the school in the mental development of the latter group.

8. In studies of race psychology, the psychologist and the anthropologist should cooperate, as only when subjects of the psychologist are analyzed biologically into their racial elements can we really speak of race differences in mental ability.

*Mental Fatigue of Indians of Nomadic and Sedentary Tribes.*

THOMAS GARTH, University of Denver.

*Problem:* To ascertain whether full blood Indians of nomadic tribes are able to resist the onset of so-called mental fatigue more successfully than full blood Indians of sedentary tribes.

*Materials and Subjects:* The materials of the experiment used for measuring the efficiency of the subjects were the Thorndike Addition Sheets which have been used in similar experiments by the experimenter in studying fatigue during the continuous exercise of a single function with whites, Indians—full and mixed bloods—and negroes. The subjects were groups of plains and southeastern Indians, called nomadic Indians, and pueblo or southwestern Indians, called sedentary Indians. There were of nomadic Indians 61 younger subjects and 47 older subjects, and of sedentary Indians 57 younger and 66 older subjects. All the subjects were full blood Indians. The factor of education was held constant.

*Administration and Results:* The subjects worked continuously on the problem of addition for 28 and 42 minutes respectively for the older and younger individuals. Individual work curves were obtained from the records and these were averaged for younger and older blood groups and presented in two categories of attempts and accurates. In comparisons of work at beginning and end of the total work period, the nomadic groups excel the sedentary groups in both attempts and accurates in resisting the onset of fatigue, that is the latter tend to fall away more than the former. A further study of the work curves shows that the sedentary Indians are more given to initial spurts, and that they behave more like white individuals as determined by their work curves than do the nomads. Introspective data, or reports of feelings of fatigue, from such inexperienced



subjects indicate that the sedentary Indians do not acknowledge feelings of fatigue as freely as do the nomadic Indians though they "fatigue" more.

## SYMPOSIUM: THE CONTRIBUTIONS OF FREUDIANISM TO PSYCHOLOGY

FRIDAY, DECEMBER 28, 3:30 P.M.

*"The Influence of Freudianism on Theoretical Psychology."* L. L. THURSTONE.

*"The Nature of Subconscious Activity as Seen in an Instance of 'Scientific' Inspiration."* JAMES H. LEUBA.

*"The Physiological Analysis of the Drive vs. the Libido."* K. S. LASHLEY.

*"The Neurological Concepts of Behavior."* JOSEPH JASTROW.

## ADDRESS OF THE PRESIDENT LEWIS M. TERMAN

## THE MENTAL TEST AS A PSYCHOLOGICAL METHOD

STANFORD UNIVERSITY

FRIDAY, DECEMBER 28, 8:00 P.M.

## MENTAL MEASUREMENT

SATURDAY, DECEMBER 29, 9:00 A.M.

*The Reliability of the Order of Merit Method.* WARNER BROWN,  
University of California.

Advertisements were arranged in order of merit under several sets of directions. The high correlations resulting were suspected on the ground that they might reflect a "halo" under which the successive judgments were mutually affected by one another. But when the same sets of directions were given to entirely independent groups of judges, one direction to each group, correlations were found almost as high as before. The reliability of the correlations was proved by

repetition of the judgments by still other judges six years later. It is concluded that the original ratings are reliable because they are determined by true differences in the material producing the responses; that correlations between successive ratings depend mostly on actual features of the material and not very much on the "halo."

Furthermore, since the form of the directions does not greatly affect the rating, it is thought that a laboratory rating may correspond closely with the actual effectiveness of the advertisements.

*Comparison of Student and Faculty Judgments of Intelligence.*

L. W. WEBB, Northwestern University.

The problem investigated in this study is the comparative value of judgments of intelligence of the same group by faculty and students.

In one of my classes there was a total of 104 members, 53 men and 51 women. These students were sophomores, juniors, and seniors. The names of the students in the class were mimeographed and sent to each member of the faculty with the following instructions: "Consider all the students on the campus whom you know. Divide them into ten groups basing your judgment upon their intellectual ability; the students of the highest ability to be in group 10, the next highest in group 9, and so on to the poorest students, who will be in group 1. Will you look over the following list of students; in the column marked *Rank*, place opposite each student's name the number from 10 to 1 according to which group you think he belongs as per the ten relative intellectual groups mentioned above?" The students used the same method in judging the intelligence of one another. The students were urged to rate only the ones well known to them.

Three intelligence tests were given to the students: Army Alpha and two tests devised by Thurstone called A and B. The complete scholastic record of each student was secured from the registrar's office. The validity of the judgments of the groups was estimated by determining the central tendency in each instance and by correlating the judgments with other standards.

In comparing the entire group, only a small difference is noted in the average for the faculty and the student results. There is about the same amount of difference between the average of each group and each of the various standards employed as a basis of comparison. However, as tested by range, A. D., S. D., and Q. D., the faculty shows a wider variability in their judgments than do the students.

When the group is separated according to sex practically the same results are found except that the judgments of women by women vary to about the same extent as do the judgments of the faculty of women.

In correlating the judgments with other values the students obtained a higher value for  $r$  in all four instances of comparison; the differences ranged from 3 to 18 points. However, the faculty obtained a value of 10 points higher when comparison is made with average scholarship. In judging men and women separately the same results obtained for the women students and the faculty. The correlation values for men students are lower than the faculty in each instance.

The conclusions based on these results are: (1) Combined judgments of students are at least of equal value to those of the faculty in estimating intelligence of fellow students; (2) scholarship appears to be the deciding factor in the ratings of both groups; (3) other factors than scholarship appear to influence more largely the judgments of students.

*Intelligence Tests versus Entrance Examinations as a Means of Predicting Success in College.* ADA HART ARLITT,\* Central Clinic, Cincinnati.

This investigation, begun in 1919 and completed in June, 1923, was undertaken to determine (1) the relative value of the record in intelligence tests as compared with the record in entrance examinations as a means of predicting success in a college which admits through the regular channels of entrance examinations, (2) whether the record in intelligence tests could be used to exclude students who succeeded in passing the entrance examinations but were not capable of doing adequate work in college, (3) the relative merits of two intelligence tests and entrance examination grades as a means of selecting students who will do the least adequate work in college.

The subjects, 305 in all, were students who entered Bryn Mawr in 1919, 1920 and 1921. The tests used were the Stanford Revision of the Binet Tests and the Thurstone Freshman Tests, series 1919 and 1920. One group was given the Stanford Binet alone, a second group was given both the Stanford Binet and Thurstone Tests, and a third group was given the Thurstone Test alone. Correlations were made between the scores in the tests and marks received at the

\* With the assistance of Margaret Hall.

end of each year. A study was also made of the percentile distribution in college marks of the students making scores at or below the 25th percentile in intelligence tests.

The following conclusions are drawn: (1) that neither the Thurstone Tests Score nor the I.Q. correlate as highly with marks received in college as do the grades received in entrance examinations, (2) that the Intelligence Test could not with fairness be used to exclude students who had passed the entrance examination since a large percentage of the students at or below the 25th percentile in Intelligence Test Score do adequate college work and less than half of the lowest 5 per cent in Intelligence Tests are excluded from college for poor work, (3) that the I.Q.'s selected the students whose work proved poorest better than did the entrance examination grade or the score in the Thurstone Test.

A comparison of the results of this investigation, together with the results of previous investigators in the field lead the writer to conclude that Freshman Tests are not accomplishing all that is expected of them. The problem here is somewhat more difficult to solve than was the problem of separating children into groups according to mental age.

*Special Ability Tests as Used in Missouri; Including a Demonstration of a Typical Test.* MAX F. MEYER, University of Missouri.

1. "Intelligence Tests" are equivocal and therefore of doubtful value in vocational guidance.

2. Special ability tests, to the extent to which they are univocal, have a real value in vocational guidance.

3. The more the correlation between tests approaches zero, the better the tests.

4. The higher the correlation, the more warranted the assumption that they test merely what Claparede has strikingly called "intelligence globale."

5. Univocal tests of special abilities should be devised on the basis of anatomical and neurological reasoning.

6. The term "learning test" should be abolished whenever it refers to measurement at a single "sitting."

7. Learning capacity should be measured by the parameter *L* of "the equation of the learning curve." (*Am. J. Psy.*, April, 1923, p. 206.)

8. Special ability tests should be of the nature of *generalized trade tests*.

9. Special ability tests should be given coined names, as unsuggestive of philosophy as possible.

10. The Bureau of Personnel Research of the University of Missouri possesses thus far the testing pieces described below:

a. The *Lectometer* measures how theatheratic (sight-hunting) the subject is, or whether he can "read off" well.

b. The *Obe-imeter* measures how echotheratic (sound-hunting) the subject is.

c. The *Tirometer* measures how kintheratic the subject is for time (how well he hunts a kinesthetic stimulation signifying time).

d. The *Exactometer* measures how kintheratic the subject is for space (how well he hunts a kinesthetic stimulation signifying spatial relations).

e. The *Concertometer* measures how well a musician can play with other musicians (orchestra) in concert.

f. The *Rhythmometer* measures how much a subject in action hunts certain group motions. The piece is in process of reconstruction.

g. The *Hymnometer* measures how much a subject hunts ups-and-downs in sound combinations. Price: (See *Terpometer*, of which it is a modification.)

h. The *Terpometer* measures how much a subject hunts melodiousness in sound combinations.

i. The *Gnomometer* measures how lexitheratic the subject is, how well he hunts meaningful words.

j. The *Stabilimeter* measures how quickly the subject becomes a victim of "nervousness" ("emotion") resulting from his own mistakes.

k. The *Abstractometer* measures how soon the object invents and applies "symbols" in the solution of a puzzle. The piece is being designed.

11. A "psychological" test *must be a group test and cheap* no more than an oculist's eye test must be a group test and cheap.

12. A good testing apparatus accepts no errors, but automatically forces the subject to correct them as soon as made.

13. A good testing apparatus is one which measures the time in which a definite but variegated task is completed free of all errors.



14. Under no circumstances should a test score be a juggled composite of both a time measurement and a count of errors made. If time is the variable measured, errors are not admissible.

## CLINICAL AND EDUCATIONAL PSYCHOLOGY

SATURDAY, DECEMBER 29, 10:00 A.M.

*Experiments in Waking Hypnosis for Instructional Purposes.*  
WESLEY RAYMOND WELLS, Lake Forest College.

One great merit of such a book as Dr. Prince's *The Unconscious* for classroom use in abnormal psychology is the ease with which it lends itself to a presentation of fundamental aspects of dissociation by means of experiments in hypnosis (as well as in abstraction, automatic writing, and crystal gazing). But such experiments in hypnosis as are described or suggested in the book, *e.g.*, experiments involving the production and removal of amnesias, posthypnotic phenomena, subconscious computation, subconscious perception, etc., are of the sleeping type of hypnosis in some of its degrees or stages. Beginning with experiments in sleeping hypnosis to illustrate points in Dr. Prince's book, the writer has found more advantageous in most cases the use of a method of completely waking hypnosis. In waking hypnosis no reference is made to sleep or drowsiness in the preliminary explanation to the subject or in the process of inducing the desired condition of dissociation; and nothing resembling sleep or drowsiness is experienced by the subject. And yet in subjects who have never been deeply hypnotized at all, as well as in those who have previously experienced the deep hypnotic trance, as satisfactory results have been produced in a completely waking state as could be produced in deep, sleeping hypnosis, for purposes of demonstrating amnesias, post-hypnotic automatic phenomena, the recovery of memories of what was not originally perceived consciously (subconscious perception), subconscious problem-solving, and other phenomena of importance in the study of dissociation. Waking suggestion is commonly recognized, but not as giving results of a degree equaling the results of deep hypnotic suggestion. The term "waking hypnosis" is used in the paper for a type of suggestion which gives results in a completely waking state comparable to the results ordinarily produced in deep, sleeping hypnosis. The methods employed and results obtained in typical experiments are described.

*Sources of Error in the Use of Statistical Methods for Individual Study.* GRACE H. KENT, Worcester State Hospital.

Owing to the success of tests in the army and in schools, there is a tendency to exaggerate the accuracy with which an individual subject may be rated by standard tests. It is conceded by advocates of group tests that clinical subjects are entitled to individual examination, but the individual test is sometimes made almost as formal and impersonal as a group test. In the public school clinics of Massachusetts it is customary to test all children by the same method, administered in the same way. The interpretation is largely statistical, and little attention is paid to the individual findings. The external conditions of the test are controlled, as far as possible, but the subjective conditions under which the test is received are wholly disregarded.

The testing of insane subjects presents special difficulties, and records obtained from the same patient at different times may show discrepancies of three or four years.

As an aid to the observation and recording of incidental factors which are frequently more significant than the results of the test, we have adopted a special form to be filled out during and immediately following the examination. Under "Gross Observations," we make note of: (1) emotional manifestations, especially depression, elation, irritability, apathy, fearfulness; (2) speech defect, coördination, nervousness. Under "Reactions to Tests," we record notes on: (1) adaptability to conditions; (2) comprehension of instructions; (3) coöperation and interest; (4) attention; (5) persistence; (6) susceptibility to fatigue; (7) rate of working, in performance tests; (8) method of working, whether by plan or by trial and error. After the record has been scored, additional notes are recorded concerning: (1) improvement with practice; (2) comparative strength in accuracy and speed; (3) comparative strength in language tests, mechanical performance, tests of discrimination and judgment, and memory tests.

This outline has been found helpful for interpretation of results. It does not take the place of independent notes recorded under "remarks," and it is not intended to discourage spontaneity of observation, but it is conducive to careful and systematic study of the patient as a person.

*Some Findings in the Clinical Study of Five Hundred "Problem" Children.* PHYLLIS BLANCHARD, Clinic No. 3, and RICHARD H. PAYNTER, JR., Clinic No. 1, National Committee for Mental Hygiene.

This study compares some of the findings on 500 problem children who were given medical, psychological, psychiatric examinations and on whom a social history was obtained with similar data concerning an unselected group of 337 children which serves as a control group. The ages range from four to sixteen years in both groups. The ratio of white and colored and of American and foreign parentage is approximately the same in both. In the problem group, nearly two-thirds are boys while in the control group only slightly over one-half are boys.

Nearly twice as many children in the problem as in the control group show retardation in school; more than twice as many show marked speech defects; about three times as many in the problem group have personality difficulties; over three times as many show marked physical defects; six times as many of the problem group show conduct disorders.

I.Q. distribution: The number of children having I.Q.'s between 80 and 90 is almost the same in the two groups, but two and a half times as many children in the problem group as in the control group have an I.Q. below 80, while less than one-half as many of the problem children have an I.Q. above 90.

There are fewer problem children who are graded at or above average for their chronological age, but more who are graded below average: 44.2 per cent of the problem children were graded from one to four years above their mental ability while only 7.6 per cent of the control group show a similar misgrading.

These comparisons suggest that the conditions which appear more frequently in the problem group may be among the causes which underlie the child's maladjustment at home or at school. In this connection we may enumerate mental retardation and mental defect, speech defects, physical ills, personality difficulties, and misgrading in school. In order to check up the validity of these deductions, the causative factors were tabulated in 250 of the 500 problem cases. In this tabulation, personality difficulties, mental defect and mental retardation were among the most frequently listed causes, and were exceeded numerically only by poor heredity and poor home environment. Physical defects were fourth in order of frequency in the

analysis of the 250 cases. Speech defects and misgrading were less frequently listed as causative factors.

Our findings suggest certain formulations of interest to educational and clinical psychology.

*A Comparison of the Mental Ability and School Achievement of the Bright and Dull Pupils in the Sixth Grade of a Large School System.* M. J. VAN WAGENEN, University of Minnesota.

That the quality of school work—the quantity of achievement in relation to mental age—of the mentally underage pupils in any school grade is superior to that of the mentally overage, has been the conclusion of several investigators. The results of a series of mental and educational tests given to all pupils throughout the sixth grade of a large school system near the close of a year's work furnished material for a detailed analysis of such an inference.

On the basis of achievement records of some 1200 boys and girls, evenly scattered as to sex and grade, throughout the sixth, seventh, and eighth grades, mental age norms had been previously computed for the mental ages of twelve, thirteen, and fourteen for a series of educational tests. The regression equations were then computed and used for extending the mental age norms in each direction. This insured comparable norms at each end of the range of mental ages. On the basis of these mental age norms the achievement quotients were found for the 1300 sixth grade boys and girls in each phase of school work measured. Medians were computed of the achievement quotients of all boys and of all girls; of all boys and of all girls mentally under eleven years three months; and of all boys and of all girls mentally fourteen years three months or above.

The results indicate that in reading, as measured by the Thorndike-McCall reading scales, and in thought problems in American history, the mentally overage boys and mentally overage girls were equal to or superior to the mentally underage. The mentally overage girls were also superior to the mentally underage girls in range of information in geography. In all other phases of achievement measured—spelling, range of information in American history, thought problems in geography, fundamentals operations in arithmetic, and arithmetic problems—the mentally underage of both sexes surpassed the mentally overage. While the mentally underage boys surpassed the groups of all the sixth grade boys in all tests except reading and range of information in history, the mentally underage

girls surpassed all sixth grade girls in spelling and the fundamental operations of arithmetic only. The group of all sixth grade boys surpassed the mentally overage boys and the group of all sixth grade girls equaled or surpassed the mentally overage girls in quality of work in all phases of achievement measured.

*A Psychological Study of Some Rural Children.* BIRD T. BALDWIN  
AND LORLE I. STECHER, State University of Iowa.

This paper reports preliminary results of some psychological examinations of children of an entire rural community in which the Iowa Child Welfare Research Station is carrying on a three year program designed to interpret the life of the rural child from many points of view—medical, psychological, sociological, economic, educational. The larger investigation is being made with the coöperation of fourteen departments and colleges of the State University and with the financial assistance of the Laura Spelman Rockefeller Memorial.

The results of individual intelligence examinations place these children in the lower part of the average group (average I.Q. 91), although the prosperity of the countryside and the progressive spirit of the parents would lead one to expect a higher level of intelligence on tests. In vocabulary, reading and other tests involving facility in the use of language, the rural children are especially deficient. The wide range of performance shown in the individual records points to irregularity of mental development. In group tests where language is not particularly involved, the children are in the upper division of the average group. Other characteristic reactions are due probably to the special conditions of rural life as much as to native ability.

The detailed analysis of the various influences brought to bear on the child, together with the consecutive records of development, gives a background for an evaluation of the mental and emotional life of the rural child.



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